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**FINAL REPORT
OF THE
STUDY COMMITTEE TO DEVELOP A
COMPREHENSIVE PLAN TO REDUCE
TOXIC EMISSIONS AND EXPAND
PLASTICS RECYCLING**

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1. EXECUTIVE SUMMARY

During the 120th Legislative Session, the Joint Standing Committee on Natural Resources considered L.D. 1543, *An Act to Reduce the Release of Dioxin from Consumer Products into the Environment*. (Appendix A) This bill proposed, along with a number of policy recommendations, that 'the burning of construction and demolition debris containing plastics, including dioxin forming products as {to be} defined in {proposed language at} Title 38, section 1681, is prohibited whether burned on-site or at municipal solid waste disposal facilities'. This action was part of a proposal to restrict the disposal of chlorinated plastic products to prevent them from being burned openly or incinerated in a solid waste combuster, which results in the release of hydrochloric acid. The hydrochloric acid may combine with organic compounds to form dioxins and furans, which are carcinogenic, and could then be released either through air emissions or become included with the ash from the incinerator's operation.

The Natural Resources Committee heard much diverse testimony on this topic. When voting out a bill that later became Public Law Chapter 277, which: placed a ban on the use of backyard burn barrels; set a state goal to reduce the total release of dioxin and mercury to the environment with the goal of its continued minimization and, where feasible, ultimate elimination; and among other actions, chose to have further study on a number of concerns related to plastics. The committee passed a Legislative Resolution (Appendix B), seeking Legislative Council approval and funding for carrying out the work envisioned by the Resolve. However, the Resolve was not funded. The Natural Resources Committee then asked the State Planning Office if they were willing to conduct this study, which they agreed to do and to follow the intent of the resolve.

The State Planning Office, Waste Management & Recycling Program, organized the study group (Appendix C) and convened the first meeting in September of 2001. Six more meetings were held, the final one in October of 2002. Attendance at these meetings varied, with a self established quorum of ten members being reached less than half of the time. The study group reviewed and worked on these five assigned tasks:

1. Undertake an analysis of plastics generation by type and current method of disposal;
2. Study the feasibility of expanding the State's bottle deposit laws to include containers made of high density polyethylene, polyethylene-terephthalate or polyvinyl chloride;
3. Study the feasibility of reducing the toxicity of waste, including the diversion of polyvinyl chloride from incineration;
4. Recommend market-based recycling opportunities for plastics; and
5. Recommend incentives for expanded in-state end uses for plastics.

In completing its tasks, the study group agreed on a chart that provides a view of plastics in the municipal solid waste stream, their application, and method of disposal. This chart was very useful as they worked on the other four tasks.

Several members of the 'Plastics Study Group' supported expanding the bottle bill to include the # 1 and # 2 plastic bottles from non-beverage applications, but would limit their return only to redemption centers, not to include retailers. Many members believed expansion of the state's existing bottle redemption program has merit, but this option needs to be reconsidered at a later point in time, once the other Legislative Study Commission has completed its work. However, several members of the Plastics Study group remained convinced that expansion of the bottle bill program could be accomplished and would result in more recovery of plastic containers.

Discussion on the science necessary to support the proposition that incineration of polyvinyl chloride plastics may lead to the formation of dioxins ended up in a three pronged debate: which products in the municipal solid waste stream are made with or contain polyvinyl chloride or other chlorinated plastics resin; the properties of this material that make it attractive to a product manufacturer; and, the importance of having it diverted from incineration. The chart developed under Task # 1 was useful in addressing the first component of this discussion. Considerable material was provided from the environmental representatives and the plastics industry representative on this topic. Even though the science relative to dioxin formation and the types and sources of compounds necessary for this reaction to occur is not conclusive, there was substantial support for efforts that would result in the diversion of polyvinyl chloride plastics away from incineration; the representative of the plastics industry did not support this action and nor did he endorse the deselection of any plastic.

The remaining two tasks, having to do with market development opportunities for plastic manufacturers and possible financial incentives and packages that could be offered a manufacturer or production company, were debated. However, the group was unable to formulate recommendations to positively address these development opportunities. In light of the State's current financial condition, subsidies and tax considerations were dismissed as being unrealistic. However, increased collection of plastics through municipal recycling programs was recommended as a potential way to increase the volume of plastics available and may aid in possibly attracting a business to Maine.

2. OVERVIEW OF PROCESS, MEETINGS, 'CHARTER STATEMENT'

Using the intended Resolve as a guide, the State Planning Office contacted the identified members and organizations to solicit their support in carrying out the work envisioned. Invitations were sent out and a list of participating members was developed. There were also a number of people and organizations interested in this study group's work that were also added to the listing. A listing of members is found in Appendix C.

The services of a facilitator were obtained: Anne Schink, an experienced facilitator who works with the Commission for Community Service within the State Planning Office, provided this support to the group.

A series of meetings were planned but not scheduled at the outset. Instead, the group decided at each meeting when the next meeting would be held. A total of seven meetings were held, between September 18, 2001 and October 31, 2002. Attendance at these meetings varied, with a self established quorum of ten members being reached at less than half of the meetings.

At the first meeting, guidelines for group norms and ground rules for operating the meetings under were proposed, discussed and ratified. The group agreed to strive to make decisions using consensus agreement. Consensus means that all views have been considered and the decision is the best possible under the circumstances. Members believe that, even though they may agree with it only 75%, they will support it 100%. Consensus means that every Study Group participant can live with the result.

During the first meetings, the group debated what a 'Charter Statement' should look like, to assist in guiding the study group through its review of information and in tackling the assigned topics. After several meetings, and numerous modifications, the following was adopted as the group's '**Charter Statement**':

- ❖ *In order to address public health, environmental and disposal concerns, and to be consistent with Maine's solid waste management hierarchy and policies, explore both the feasibility and range of methods for recovery and recycling of plastics.*
- ❖ *This will be accomplished in part through the identification, analysis and consideration of existing behavioral, scientific, technical and economic barriers and/or incentives to plastics recovery and recycling.*
- ❖ *This review shall be the basis for recommendations on possible actions that could lead to increased plastics recovery and recycling, market development and/or improved disposal management systems.*

3. REVIEW OF ASSIGNED TASKS, DISCUSSIONS AND CONCLUSIONS

a. Undertake an analysis of plastics generation by type and current method of disposal.

The State Planning Office collects municipal solid waste generation and disposal data from municipalities and regions on an annual basis, and from processing/disposal facilities on a biennial basis. This information is then utilized in assisting the review of municipal recycling efforts and solid waste disposal capacity remaining within the state. However, the data collected does not provide a detailed review or 'waste stream characterization' of the materials actually found in the solid waste stream, nor the amount of each material.

The importance of this task was to be able to illustrate the various applications of plastics and the percentage of those various products in the waste stream, which would then lead to discussions on how to better manage, or divert from incineration and disposal, the discarded plastic products. Without this level of detail available, the study group would be attempting to develop recommendations without supporting data that could be of assistance in reviewing options.

To achieve the goal indicated by this task, the State Planning Office developed a series of spreadsheets that attempted to identify the components within the state's municipal solid waste stream and include the method of disposal utilized. Without state specific data available, the Office relied upon the US Environmental Protection Agency's '1999 Municipal Solid Waste Characterization Study', produced by Franklin Associates. This report provides a detailed breakdown on what is typically found in the municipal solid waste stream and the breakdown on plastics was used by the State Planning Office as the 'template' for tonnages and composition of plastic discards in Maine's municipal waste stream. The State Planning Office used 1999 Maine municipal solid waste tonnages generated, and management options, as provided by municipalities and disposal facilities, as the dataset for the application of these 1999 EPA report numbers.

The State Planning Office developed several variations of tables and spreadsheets that attempted to show the various plastic resins and how they are 'found' in the municipal solid waste stream and their final disposal method. The final rendition of the spreadsheet may be found in Appendix D, '*Plastic Resins Estimated to be in Maine's Municipal Solid Waste Stream (MSW) and How They are Managed*'.

This chart shows that plastics comprised 10.5% of the municipal waste stream (by weight) in 1999. For Maine, that amounted to 152,992 tons of plastics in 1999 that would have been discarded. (The returnable beverage container tonnages are included in this total). The chart provides information for the seven identified resin types and how the various resins are used/found in the solid waste stream, either as a 'durable good' or 'non-durable good'. For the purposes the EPA report, Franklin Associates defined a 'durable good' as a product with three years or more of useful life and a non-durable less than three years of useful life. In terms of how the plastics are disposed of in Maine, aside from the tonnage that is recycled, approximately 70 percent by weight are incinerated and the remaining 30 percent is landfilled.

Upon review of this chart, one can readily see that 29.7 percent of the plastic found in the municipal solid waste stream is from durable goods. Where durable goods have a life expectancy of three years or longer, and would tend to be used in products that are not typically incinerated but would be recycled or disposed of in a landfill, and might constitute only a portion of a larger item, the study group agreed that their focus should be upon the nondurable goods.

When the plastics applications are considered, in light of the nondurable goods categories, it was determined that 17.6% of the discarded plastics (by weight) were in soft drink, milk and water bottles and other plastic containers. A nearly equal weight (17.5%) of plastics is used in bags, sacks and wraps with another 11.1% used in 'other plastics packaging'. The remaining discarded plastic products (24.1%) are plastic plates and cups, trash bags and all other nondurables.

The group discussed various methods and techniques available to assist with the removal and recovery of the plastic products found in the municipal solid waste stream.

It was noted that each municipality is responsible for the disposal services related to the municipal solid waste generated within their boundaries; each community in Maine has developed a solid waste program that best suits the management of their solid waste being generated, with the net result being that current municipal solid waste programs are diverse and diffuse, which make any statewide recommendations potentially difficult to implement. For example: there are over 300 recycling programs operating throughout the state, each serving either a single community or regional group, and each with its own set of recyclable materials and processing operations. In addition, the disposal facility selected by a community may impact the composition of the waste stream sent off for disposal, i.e., incinerators may have different standards for what constitutes 'acceptable waste', versus the receiving standards of a secure landfill. There was agreement among the members that education of the general populace was essential to the success of any program.

b. Study the feasibility of expanding the State's bottle deposit laws to include containers made of high density polyethylene, polyethylene-terephthalate or polyvinyl chloride

The group explored the possibility of expanding the very successful 'bottle bill' program in Maine to include plastic containers, as a way of increasing the capture rate of plastics from the municipal solid waste stream. Beverage manufacturers and distributors report a redemption rate well in excess of ninety percent for beverage containers that are covered by the deposit legislation, so this concept appeared to be worth exploring, as another means of increasing the capture of plastic containers from the municipal solid waste stream.

Discussions centered about the types of products and container/bottle applications and how best to integrate an expanded list of materials into the existing program, in order to provide an incentive for residents to increase the diversion and recycling of plastics. The chart developed as part of the first task of this study of the composition of the plastic waste stream was reviewed and an attempt was made at identifying possible plastics

applications that would fit into the current bottle bill system.

The rationale for expanding the bottle bill was offered and discussed:

- ❖ Maine residents have embraced the bottle bill program. Expanding it to include more plastic bottles would result in a higher capture rate than is presently realized through public recycling programs.
- ❖ The bottles would readily fit into the existing processing and marketing systems currently in place.
- ❖ Purchasers would be more fiscally inclined to redeem the container, with a deposit on it.

A number of concerns were raised with the proposed expansion, which were also discussed by the group:

- ❖ The existing bottle redemption program is 'at capacity' and the expansion of the program to include more containers, while noteworthy, raises the possibility of collapsing the existing system.
- ❖ The beverage containers and bottles redeemed and captured through the 'bottle bill' program are clean and command a higher scrap value than non-beverage plastic bottles collected in other recycling programs. Expanding the bottle bill to include non-beverage containers would result in lower prices for the collected and processed containers, and/or may limit end use market options for the containers.
- ❖ Concerns were voiced regarding the retail food establishments accepting 'dirty' bottles and storing them in close proximity to foodstuffs, as was raised with this question 'Just how close to the Reuben sandwiches do we want the used container of motor oil?'.
.
- ❖ Questions were also raised about who would become the 'Initiator of Deposit' for the redemption value of the plastic bottles. This identification issue continues to be one of the major concerns facing the Department of Agriculture in administering the current bottle bill program and would likely be more of an issue with redemption values on household products that may not have a specific distribution area or distributor.

George MacDonald provided information and an update on the reestablished (by the second session of the 120th Legislature) Legislative Study Commission, named "The Committee to Study Reimbursement Rates for Maine's Bottle Redemption Businesses and Other Issues Related to the Handling and Collection of Returnable Containers". Mr. MacDonald is serving as staff to this Committee. The directive given to this other effort follows:

The committee shall study issues related to the operation of bottle redemption businesses and to the handling and collection of returnable containers. In examining these issues, the committee shall:

- *Develop a process for identifying ways to improve the efficiency of the returnable container deposit law;*
- *Examine potential improvements including redesigning the operation of the system;*
- *Study the viability of establishing cooperative container pick-up arrangements between redemption centers, distributors and collection agents;*
- *Further study possible technological improvements that will enhance the efficiency of the returnable container deposit law; and*
- *Further examine the impact on rates of return of a proposal included in the report of the Committee to Study Reimbursement Rates for Maine's Bottle Redemption Businesses and Other Issues Related to the Handling and Collection of Returnable Containers that would decrease from 15¢ to 5¢ the refund value of wine and spirit containers of greater than 50 milliliters that are sold in the State.*

Given the issues being studied by this other group, several members of the 'Plastics Study Group' supported expanding the bottle bill to include the # 1 and # 2 plastic bottles from non-beverage applications, but would limit their return only to redemption centers, not to include retailers. Many members believed expansion of the state's existing bottle redemption program has merit, but this option needs to be reconsidered at a later point in time, once the other Legislative Study Commission has completed its work. However, several members of the Plastics Study group remained convinced that expansion of the bottle bill program could be accomplished and would result in more recovery of plastic containers.

c. Study the feasibility of reducing the toxicity of waste, including the diversion of polyvinyl chloride from incineration

This portion of the study group's effort was broken into two larger discussions:

1. 'which products in the municipal solid waste stream are made with or contain polyvinyl chloride resin';
2. 'the properties of this material (polyvinyl chloride) that make it advantageous to use and the value of having it diverted from incineration'.

c. 1) *'which products found within the municipal solid waste stream that are made with or contain polyvinyl chloride resin'*. The study group re-examined the plastics resins' chart developed to address Task # 1. Upon review of this chart, the following conclusions and recommendations were drawn:

- Nearly thirty per cent (30%) of the plastic resins found in the municipal solid waste stream are either durable goods or components of durable goods. Twenty nine

percent (29%) of the discarded polyvinyl chloride resin is estimated to be in durable goods. Durable goods have a life expectancy of three years or longer, and tend to be used in products that are not typically incinerated but would be recycled or disposed of in a landfill. Where the resin might constitute only a portion of a larger item, the study group agreed that their focus should be placed upon nondurables.

- Of the nondurables, twenty four percent (24%) of the total plastic resins in municipal solid waste are found in plastic plates, cups, trash bags and other nondurables. Thirty eight per cent (38%) of the discarded polyvinyl chloride resin is found within this category. Given the intended application of this portion of the nondurables waste stream, the study group agreed that targeting these items for separation from the overall municipal solid waste stream would not be easy, nor perhaps an overly productive, task.
- In the nondurable category of 'Plastic Containers and Packaging', the study group looked at each of the five subcategories individually and found that polyvinyl chloride resin appears to be utilized in three of them:
 - ❖ Other Plastic Containers – this category appeared to be the most significant one to target for removal of these containers from the waste stream for recycling or disposal by other than incineration. This line of products accounts for eleven per cent (11%) of the plastics disposed of. Polyvinyl chloride plastic resin accounts for 6% by weight of the containers identified in this category.

While a portion of these containers are being collected and recycled, predominantly the PETE (#1) and HDPE (# 2), which account for 83% of this category, the current recovery rate could be expanded either through increased public recycling programs and/or an expanded 'bottle bill'.

The increased recovery of plastic containers listed in this category might be accomplished through the implementation of an 'all bottle recovery program'. Under this type of program, residents separate all plastic bottles (containers with 'necks' only) out for collection, regardless of the 'number' that appears on the bottom of the bottle. These bottles are collected, delivered to a facility, sorted by resin type and the plastic containers sent to processors for recycling or other purpose. This style of collection program has been shown to increase the total amount of plastic bottles recovered from residents. The recycling center becomes responsible for managing the various types of resins recovered.

While the group discussed the implementation strategies and actual management of the recovered plastics, many members believed that this type of program has value and supported funding a couple of municipal program pilot projects that could provide data for assessing the value and impact of such a collection program; that information could then be reviewed, for possible replication with other recycling programs.

- ❖ Bags, Sacks, & Wraps – the study group agreed that this sub-category would be difficult to target for removal from the waste stream, given the nature and intent of the products utilized, even though this is the largest 'nondurable product' category. Polyvinyl chloride resin constitutes approximately two percent (2%) of the tonnage of this category of products. Contaminated materials, whether with

foodstuff or other products, greatly impair the ability of the product to be recycled, or even managed separately from other parts of the waste stream.

- ❖ Other Plastics Packaging – this remaining sub-category comprises eleven percent (11%) of the plastic resins found in Maine’s municipal solid waste stream. This category captures plastic packaging resin applications too numerous to identify specifically. Polyvinyl Chloride resin constitutes approximately ten percent (10%) of the tonnage of this category of products. Again with this category, and the applications of the resins, the group did not consider further investigation as to possible removal and/or recovery of these products.

c. 2) ‘the properties of this material (polyvinyl chloride) that make it advantageous to use and the value of having it diverted from incineration’. Polyvinyl chloride has numerous physical and chemical properties that make it attractive for use in many applications, and as a result, may be found in many durable and nondurable products.

During the last legislative session, LD 1543 was introduced, entitled “An Act to Reduce the Release of Dioxin from Consumer Products into the Environment”. This LD, which is Appendix A, included language that was part of a larger proposal to restrict the disposal of chlorinated plastic products, to avoid the burning or incineration of plastics that may result in the release of dioxin into the environment. The State did adopt the following policy:

38 MRSA §2132, sub- § 4

4. Reduction in dioxin. It is the policy of the State to reduce the total release of dioxin and mercury to the environment with the goal of its continued minimization and, where feasible, ultimate elimination.

Incineration of polyvinyl chloride plastics results in the release of hydrochloric acid, which may combine with organic compounds in the incineration and resulting process, to form dioxins and furans. However, science has not identified the exact mechanism and quantitative relationship of the reaction between polyvinyl chloride and dioxin. Dioxins and furans, which are carcinogenic compounds, could then be released through air emissions or become part of the ash that results from the incinerator’s operation.

During the Natural Resources Committee's consideration of this proposed legislation, there was much debate over the science used to support the proposed legislation, which would have impacted current solid waste management practices of construction/demolition debris and municipal solid waste.

There were two diametrically opposed views on the subject of polyvinyl chloride incineration and its resulting emissions, specifically dioxin. The study group representatives from the environmental organizations provided numerous reports and studies that outlined the dangers of the use, and disposal through incineration, of polyvinyl chloride plastic. The plastics industry representative provided many reports and studies that presented data and evidence that reflected positively on the value of plastics in general and polyvinyl chloride in particular. The information was provided to all study group members, and discussions were held during several meetings on how best to fulfill their assignment on this topic.

Other toxics present in municipal solid waste and their processed residuals were also presented and discussed, including plasticizers (primarily within the class of chemicals known as 'phthalates'), lead, cadmium and other so-called 'heavy metals'. These materials are often used in the production of polyvinyl chloride containing products, as additives to assist in making the plastic softer and more flexible, as well as to serve as stabilizers in reducing the deterioration of polyvinyl chloride containing products. These other compounds and metals made be mobilized upon incineration of the plastic, releasing them to the environment.

Throughout the debate on this topic, where many scientific analyses were presented and reviewed, and even though a definitive link between the incineration of polyvinyl chloride plastics and the formation of dioxin was not shown, the majority of those in attendance supported identifying polyvinyl chloride plastics as a material of concern in the state's efforts to reduce the formation of dioxins and their release into the environment.

Study group members reviewed a 'tree styled' chart was developed and presented by the State Planning Office, as a tool that might be useful in a review of the various options available for the management of polyvinyl chloride plastics diverted from the municipal solid waste disposal stream. This chart is found in Appendix E.

- d. Recommend market-based recycling opportunities for plastics, and**
- e. Recommend incentives for expanded in-state end uses for plastics**

These two tasks were studied jointly, due to their similarity. To assist the study group with exploring options under this task, the facilitator and study group chair presented a chart that would allow members to rank the various plastic resins on attributes that would make the resin attractive to being recycled, including:

- Volume and weight of the plastic resin
- Consistency of flow of material (when melted and being recycled)
- Quality of polymer type
- Potential of resin as resource for reuse
- Container contents (as a quality concern for reuse, i.e., contamination of product and impact on container resin for recovery)
- Existing market?
- Color, as a quality factor

- Economic value of resin and its potential for recovery

A member pointed out that product manufacturers consider product '*Functionality, Safety, and Cost*' as the first three factors of concern when selecting a plastic for application in a product or packaging. However, recycling has since been added to this mix.

Other issues of concern relating to the chart were offered, including:

- Handling of plastics
- Political Reality of support for plastics recycling
- Level of risk associated with disposal, that plastics may present
- Consistency of demand for scrap plastics by manufacturer
- What is the BTU value of plastic and the possibility of favoring incineration over landfilling

A comment was offered that the overall volume of plastics in Maine might be too low to be a viable factor for creating a sustainable market. Also, where there are over 300 individual municipal recycling programs, an issue relating to market development was raised; given the diversity of program design and population served, collecting and processing consistent volumes of plastic bottles for recovery may complicate the attracting of a remanufacturer. Without a central collection system, it may be difficult to encourage a plastics company to locate within the state.

Conversation then turned to how the information gathered from working with the resin quality and quantify criteria identified could still be used, in identifying possible market based opportunities and incentives that could lead to increased plastics recovery and recycling in Maine.

After discussion, the group made the following observations:

- Resins #3, #5, #6, #7 may need further discussion especially #3 (PVC) when used in durable goods applications
- What are the barriers to increasing bottle bill containers?
- Would the increase in volume created by all bottle recycling, create a burden to redemption centers or other intermediate processors?
- What is the effect on the quality of collected resins when adding other products to increase economic attractiveness, and greater volumes, for greater mix of plastics.
- Quality factors affecting economics:
 - Polymer, type
 - Cleanliness
 - Container contents
 - Color

It was agreed that volumes were essential to encouraging the development of plastic end-markets in Maine and the topic turned to ways and means of increasing the capture rate of plastic bottles. Discussion was repeated from the earlier suggestion that pilot 'all bottle

recycling' programs, which was recommended under Task # 2, would be tried, as well as expanding the state's bottle bill to cover more product lines. Either of these two methods could result in a net increase in resin types # 1 and # 2 being collected and available for recycling.

Study group members were reminded that the market demand for recycled plastic cannot be currently met, so if recycling of plastic were increased, chances are very good that there would be a market for that material.

In terms of specific recommendations, the study group members considered possible financial incentives and packages that could be offered a manufacturer or production company, but given the current financial condition of the State, actual subsidies and tax considerations were dismissed.

With the limited tonnage of plastics being recovered within the State, the group supported continued promotion of recycling of plastics, in an effort to increase the tonnage of scrap that could be available for a remanufacture, in hopes that this would attract a business to the state. Tied with this concept is the recommendation from task item # 3, that pilot programs focusing on 'all bottle recovery', be tried and their results evaluated.

5. Summary of conclusions, recommendations

A summary of conclusions and recommendations follow each of the five tasks assigned to the study group, presented below:

1. *Undertake an analysis of plastics generation by type and current method of disposal*

Without state specific data available, the State Planning Office relied upon the United States Environmental Protection Agency's '1999 Municipal Solid Waste Characterization Study' for a detailed breakdown on what is typically found in the municipal solid waste stream. The breakdown on plastics was used as the 'template' for tonnages and composition of plastic discards in Maine's municipal waste stream. The 1999 Maine municipal solid waste tonnages generated, and management options, as provided by municipalities and disposal facilities, were then used as the dataset for the application of these 1999 EPA report numbers.

The accepted rendition of the spreadsheet may be found in Appendix C, '*Plastic Resins Estimated to be in Maine's Municipal Solid Waste Stream (MSW) and How They are Managed*'. This analysis was then used when studying the remaining four tasks.

2. *Study the feasibility of expanding the State's bottle deposit laws to include containers made of high density polyethylene, polyethylene-terephthalate or polyvinyl chloride*

Discussions centered about the types of products and container/bottle applications and how best to integrate an expanded list of materials into the existing program, in order to provide an incentive for residents to keep plastics out of the waste stream. The rationale for expanding the bottle bill was offered and discussed, as were concerns of and possible impediments to the proposed expansion.

Several members of the 'Plastics Study Group' supported expanding the bottle bill to include the # 1 and # 2 plastic bottles from non-beverage applications, but would limit their return only to redemption centers, not to include retailers. Many members believed expansion of the state's existing bottle redemption program has merit, but this option needs to be reconsidered at a later point in time, once the other Legislative Study Commission has completed its work. However, several members of the Plastics Study group remained convinced that expansion of the bottle bill program could be accomplished and would result in more recovery of plastic containers.

3. *Study the feasibility of reducing the toxicity of waste, including the diversion of polyvinyl chloride from incineration;*

This portion of the study group's effort was broken into two larger discussions:

- which products in the municipal solid waste stream are made with or contain polyvinyl chloride resin;

- why the selection of this material (polyvinyl chloride) and having it diverted from incineration.

In considering the first concern, i.e., the products found within the municipal solid waste stream that are made with or contain polyvinyl chloride resin, the study group re-examined the plastics resins' chart developed to address Task # 1. While discussion was had on the implementation strategies and actual management of the recovered plastics, many members believed that an "all bottle collection" program might have value and supported trying a couple of pilot projects with municipal programs that would provide data that could be assessed, for possible replication at other recycling programs. The State Planning Office is to pursue the pilot project idea with interested municipalities.

The second part of the discussion of this task was discussed, debated and grappled with from a number of standpoints and positions. Incineration of polyvinyl chloride plastics results in the release of hydrochloric acid, which may combine with organic compounds in the incineration and resulting process, to form dioxins and furans. However, science has not identified the exact mechanism and quantitative relationship of the reaction between polyvinyl chloride and dioxin. Dioxins and furans, which are carcinogenic compounds, could then be released through air emissions or become part of the ash from the incinerator's operation.

There were two diametrically opposed views on the subject of polyvinyl chloride incineration and its resulting emissions, specifically dioxin. The study group representatives from the environmental organizations provided numerous reports and studies that outlined the dangers of the use, and disposal through incineration, of polyvinyl chloride plastic. The plastics industry representative provided many reports and studies that presented data and evidence that reflected positively on the value of plastics in general and polyvinyl chloride in particular. The information was provided to all study group members, and discussions were held during several meetings on how best to fulfill their assignment on this topic.

Throughout the debate on this topic, where many scientific analyses were presented and reviewed, and even though a definitive link between the incineration of polyvinyl chloride plastics and the formation of dioxin was not shown, the majority of those of in attendance supported identifying polyvinyl chloride plastics as a material of concern in the state's efforts to reduce the formation of dioxins and their release into the environment.

Other toxics present in municipal solid waste and their processed residuals were also presented and discussed, including plasticizers (primarily within the class of chemicals known as 'phthalates'), lead, cadmium and other so-called 'heavy metals'. These materials are often used in the production of polyvinyl chloride containing products, as additives to assist in making the plastic softer and more flexible, as well as to serve as stabilizers in reducing the deterioration of polyvinyl chloride containing products. These other compounds and metals made be mobilized upon incineration of the plastic, releasing them to the environment.

4. *Recommend market-based recycling opportunities for plastics and*
5. *Recommend incentives for expanded in-state end uses for plastics*

These two tasks were studied jointly, due to their similarity. The study group explored and ranked the various plastic resins on attributes that would make the resin attractive

to being recycled, including volumes, quality of polymer, contamination of product, color, and the economics of the plastics reclamation industry.

In terms of specific recommendations, the study group members considered possible financial incentives and packages that could be offered a manufacturer or production company, but given the State's current financial condition, subsidies and tax considerations were dismissed.

With the limited tonnage of plastics being recovered within the State, the group supported continued promotion of recycling of plastics, in an effort to increase the tonnage of scrap that could be available for a remanufacture, in hopes that this would attract a business to the state. Tied with this concept is the recommendation from task item # 3, that pilot programs focusing on the 'all bottle recovery', be tried and their results evaluated.

APPENDIX A

LD 1543

Be it enacted by the People of the State of Maine as follows:

Sec. 1. 5 MRSA §1812-G is enacted to read:

§1812-G. Alternatives to the purchase of dioxin-forming products; evaluation

It is the policy of the State to avoid the purchase of dioxin-forming products whenever technically effective and reasonably affordable alternatives are available. The State Purchasing Agent, in consultation with the Department of Environmental Protection and the Executive Department, State Planning Office, shall inventory the State's purchase of supplies and materials composed in whole or in part of dioxin-forming products as defined in Title 38, section 1681. Based on this assessment, the State Purchasing Agent shall evaluate alternatives to, and establish goals for, the reduction of the purchase of supplies and materials composed in whole or in part of dioxin-forming products. The State Purchasing Agent shall report by January 15, 2003 to the joint standing committee of the Legislature having jurisdiction over natural resources matters on the results of this inventory and evaluation and on the State's efforts to purchase alternatives to supplies and materials composed in whole or in part of dioxin-forming products. The State Purchasing Agent shall include in the report any recommendations to increase or facilitate the purchase of the alternative supplies and materials.

Sec. 2. 12 MRSA §9324, sub-§7, as enacted by PL 1997, c. 512, §5, is amended to read:

7. Trash. Out-of-door burning of highly combustible trash is prohibited where municipal trash collection service is available and will accept those materials. Out-of-door burning of plastics, including dioxin-forming products as defined in Title 38, section 1681, subsection 2, rubber, styrofoam, metals, food wastes or chemicals is prohibited in all areas of the State.

For purposes of this subsection, the following terms have the following meanings.

A. "Highly combustible trash" means wooden boxes or other wood material, paper and cardboard.

B. "Municipal trash collection service" means any curbside trash collection service that is operated or contracted for by the municipality or that is required by municipal ordinance.

Sec. 3. 12 MRSA §9324, sub-§8 is enacted to read:

8. Construction and demolition debris. The burning of construction and demolition debris containing plastics, including dioxin-forming products as defined in Title 38, section 1681, is prohibited whether burned on-site or at municipal solid waste disposal facilities.

Sec. 4. 12 MRSA §9325, sub-§1, as amended by PL 1997, c. 512, §6, is further amended to read:

1. Permissible open burning with permit. When not prohibited by statute, rule of any state agency or local ordinance, the types of burning described in this subsection are allowed provided that a permit has been obtained from the town forest fire warden or from the forest ranger having jurisdiction over the location where the fire is to be set. The burning must be conducted according to the terms and conditions of the permit and may not create a nuisance. A permit is required for:

- A. Recreational campfires kindled when the ground is not covered by snow;
- B. Fires in conjunction with holiday and festive celebrations;
- C. Burning of solid or liquid fuels and structures for research or bona fide instruction and training of municipal, volunteer and industrial firefighters when conducted under the direct control and supervision of qualified instructors;
- D. Burning for agricultural purposes including, but not limited to, open burning of blueberry fields, potato tops and hayfields and prescribed burning for timberland management;
- E. Residential out-of-door burning of highly combustible trash as defined in section 9324, subsection 7 in open or enclosed incinerators where municipal trash collection service as defined in section 9324, subsection 7 is not available or will not accept those materials. The incinerator must have been inspected and approved by a municipal fire chief, town forest fire warden or forest ranger using minimum criteria established by the director for safe operation;
- F. Residential open burning of leaves, brush, deadwood and tree cuttings accrued from normal property maintenance by the individual landowner or lessee of the land unless expressly prohibited by municipal ordinance;
- G. Burning on site for the disposal of materials generated from the clearing of any land or by the erection, modification, maintenance, demolition or construction of any highway, railroad, power line, communication line, pipeline, building or development;
- H. Burning for hazard reduction purposes such as, but not limited to, the burning of grass fields;

I. Burning for the containment or control of spills of gasoline, kerosene, heating oil or similar petroleum products; and

J. The burning of brush and demolition debris at municipal solid waste disposal facilities.

A permit issued for burning activities pursuant to paragraph E, G or J must be accompanied by educational information provided by the Executive Department, State Planning Office and the Department of Environmental Protection on the prohibition on burning dioxin-forming products as required by Title 38, section 1684.

Sec. 5. 38 MRSA c. 16-C is enacted to read:

I.

CHAPTER 16-C

DIOXIN-FORMING PRODUCTS

§1681. Definitions

As used in this chapter, unless the context otherwise indicates, the following terms have the following meanings.

1. Dioxin. "Dioxin" has the same meanings as defined in section 420-A, subsection 1.

2. Dioxin-forming product. "Dioxin-forming product" means any item that has the potential to be disposed of as solid waste or to be burned if the item contains or is manufactured with plastic known as polyvinyl chloride or vinyl or plastic known as polyvinylidene chloride.

§1682. Disposal policy

It is the policy of the State to discourage the burning or incineration of dioxin-forming products and to encourage the land disposal of waste dioxin-forming products.

§1683. Labeling

1. Application. This chapter applies to both labeled and unlabelled dioxin-forming products.

2. Labeling. A dioxin-forming product is labeled if the product or its original packaging contains any of the following symbols, letters or words:

A. The number 3 inside a triangle next to the letter V;

B. PVC; or

C. Vinyl.

§1684. Education program.

The department and the Executive Department, State Planning Office shall implement an education program relating to dioxin-forming products no later than July 15, 2002.

1. Educational information. The program under this section must provide information to the public about the environmental health hazards of dioxin-forming products, how to identify labeled dioxin-forming products, the requirements of the law regarding burning of waste dioxin-forming products and collection programs or disposal options that are available to the public to facilitate land disposal of waste dioxin-forming products.

2. Priorities. Priority for dissemination of educational information described under subsection 1 must be given to persons who live or work in:

A. Municipalities that do not provide municipal trash collection service as defined in Title 12, section 9324, subsection 7 and do not prohibit out-of-door burning of highly combustible trash;

B. Municipalities that supply solid waste to a municipal solid waste incinerator; and

C. Municipalities that burn demolition debris at municipal solid waste disposal facilities.

3. Grants. The department and the Executive Department, State Planning Office may, within available resources, award grants to eligible municipalities, regional associations, sanitary districts, sewer districts and nonprofit organizations to achieve the educational purposes of this section.

Sec. 6. 38 MRSA §2133, sub-§2-B, ¶E, as enacted by PL 1999, c. 779, §3, is amended to read:

E. By January 1, 2002 and as necessary thereafter, fund capital improvements and operating expenses to facilitate the development of collection programs throughout the State for hazardous waste that is universal waste, as identified in board rules, and for waste dioxin-forming products as defined in section 1681 generated by households, small-quantity generators, public schools and municipalities. Collection programs for waste dioxin-forming products must divert that waste to land disposals.

Sec. 7. Report on dioxin releases into the environment from consumer products and building materials; legislation. The Department of Environmental Protection and the Executive Department, State Planning Office shall submit a report by January 15, 2003 to the joint standing committee of the Legislature having jurisdiction over natural resources matters on the status of dioxin releases into the environment from consumer products and building materials. The department and the State Planning Office may consult with the State Fire Marshall, other state agencies and interested parties during the preparation of the report. The report must include the following:

1. An estimate of dioxin releases into the environment attributable to the use and disposal of dioxin-forming products in Maine, including management of construction and demolition debris, structural and vehicle fires, out-of-door burning of highly combustible trash, municipal solid waste incineration and incineration of biomedical waste generated in Maine;

2. An evaluation of policy options for preventing and reducing the release of dioxin from dioxin-forming products, including environmentally preferable purchasing, labeling, product bans, use restrictions, take-back requirements and further restrictions on incineration or out-of-door burning; and

3. Alternatives to the use of dioxin-forming products.

The joint standing committee of the Legislature having jurisdiction over natural resources matters has authority to report out a bill to the First Regular Session of the 121st Legislature relating to dioxin releases and programs for the source reduction, collection and land disposal of dioxin-forming products.

SUMMARY

This bill restricts the disposal of dioxin-forming products to avoid burning or incineration that results in the release of dioxin into the environment. It establishes an education and outreach program to reduce the improper management of dioxin-forming products. It encourages the State to purchase alternatives to dioxin-forming products when practicable. The bill also requires the Department of Environmental Protection and the Executive Department, State Planning Office to submit a report to the Legislature on dioxin releases and dioxin-forming products and their alternatives.

APPENDIX B

PROPOSED COMMISSION LEGISLATIVE RESOLVE

Sec. 1. Commission established. Resolved: That the Commission to Develop a Comprehensive Plan to Reduce Toxic Emissions and Expand Plastics Recycling, referred to in this resolve as the "commission," is established; and be it further

Sec. 2. Commission membership; appointed and ex officio members. Resolved: That the commission consists of 15 members:

1. Two members of the Senate, appointed by the President of the Senate. In making these appointments, preference must be given to selecting one member who is a member of the Joint Standing Committee on Natural Resources and one member who is a member of the Joint Standing Committee on Business and Economic Development. The first appointed member of the Senate is the Senate chair of the commission;

2. Two members of the House of Representatives, appointed by the Speaker of the House. In making these appointments, preference must be given to selecting one member who is a member of the Joint Standing Committee on Natural Resources and one member who is a member of the Joint Standing Committee on Business and Economic Development. The first appointed member of the House is the House chair of the commission;

3. Three ex officio members: the Director of the State Planning Office or the director's designee, the Commissioner of Environmental Protection or the commissioner's designee and the Commissioner of Agriculture, Food and Rural Resources or the commissioner's designee; and

4. Eight persons appointed by the Governor as follows:

A. Two representatives of statewide environmental organizations;

B. One representative of the Maine Grocers Association;

C. One representative of the Maine Merchants Association Inc.;

D. One representative of the plastics industry;

E. One representative of redemption center owners;

F. One representative of the Maine Resource Recovery Association; and

G. One representative of the Maine Municipal Association; and be it further'

Sec. 3. Appointments; meetings. Resolved: That all appointments must be made no later than 30 days after the effective date of this resolve. The appointing authorities shall notify the

Executive Director of the Legislative Council once the appointments have been made. The Executive Director of the Legislative Council shall notify the chairs when all appointments have been made. The chairs of the commission shall call and convene the first meeting of the commission within 30 days after all appointments have been made; and be it further

Sec. 4. Duties. Resolved: That the commission shall:

1. Undertake an analysis of plastics generation by type and current method of disposal;
2. Study the feasibility of expanding the State's bottle deposit laws to include containers made of high density polyethylene, polyethylene-terephthalate or polyvinyl chloride;
3. Study the feasibility of reducing the toxicity of waste, including the diversion of polyvinyl chloride from incineration;
4. Recommend market-based recycling opportunities for plastics; and
5. Recommend incentives for expanded in-state end uses for plastics; and be it further

Sec. 5. Report. Resolved: That the commission shall submit its report, together with any recommended implementing legislation to the joint standing committee of the Legislature having jurisdiction over natural resources matters no later than December 1, 2002. The joint standing committee of the Legislature having jurisdiction over natural resources matters may introduce legislation during the First Regular Session of the 121st Legislature; and be it further

Sec. 6. Staff assistance. Resolved: That, upon approval of the Legislative Council, the Office of Policy and Legal Analysis shall provide staffing assistance to the commission. The Office of Fiscal and Program Review and state agencies shall also provide assistance as requested by the commission; and be it further

Sec. 7. Compensation. Resolved: That the members of the commission who are Legislators are entitled to receive the legislative per diem, as defined in the Maine Revised Statutes, Title 3, section 2, and reimbursement for travel and other necessary expenses related to their attendance at authorized meetings of the commission; and be it further

Sec. 8. Budget. Resolved: That the chairs of the commission, with assistance from the commission staff, shall administer the commission's budget. The commission may not incur expenses exceeding its approved budget. Upon request from the commission, the Executive Director of the Legislative Council shall promptly provide the commission and its staff with a status report on the commission's budget, expenditures incurred and remaining available funds.

APPENDIX C

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APPENDIX D

Plastic Resins Estimated to be in Maine's Municipal Solid Waste Stream (MSW) and How They are Managed

**PLASTIC RESINS ESTIMATED TO BE IN MAINE'S MUNICIPAL SOLID WASTE (MSW)
AND HOW THEY ARE MANAGED
(1999 DATA IN TONS)**

PLASTIC RESINS* (abbreviated and with SPI code)	TOTAL % (BY RESIN) OF PLASTICS IN MSW	SOURCES OF PLASTIC RESINS IN MAINE'S MSW										TOTAL TONS OF PLASTIC (BY RESIN) ESTIMATED IN MAINE'S MSW	MANAGEMENT METHOD					
		TOTAL TONS OF RESINS IN DURABLE GOODS **	RESINS' APPLICATIONS IN NONDURABLE GOODS **								(SUB)TOTAL OF RESINS IN NONDURABLE GOODS		RECYCLED		INCINERATED		LANDFILLED	
			Plastic Plates & Cups	Trash bags	All other nondurables	Plastic Containers & Packaging							TONS OF RESINS	% OF TONS	TONS OF RESINS	% OF TONS	TONS OF RESINS	% OF TONS
						Soft Drink Bottles	Milk & Water Bottles	Other Plastics Containers	Bags, Sacks, & Wraps	Other Plastics Packaging								
PETE (# 1)	10.1%	2,469			1,203	5,697		5,190		823	12,913	15,382	5,521	35.9%	6,597	42.9%	3,264	21.2%
HDPE (# 2)	22.1%	3,355		1,582	2,405	Neg.	4,368	8,798	4,241	9,052	30,446	33,801	4,410	13.0%	19,663	58.2%	9,728	28.8%
PVC (# 3)	6.0%	2,659			3,481			949	443	1,646	6,519	9,178	0	0.0%	6,140	66.9%	3,038	33.1%
LDPE and LLDPE (# 4)	24.9%	3,988	127	4,431	9,115			316	17,913	2,215	34,117	38,105	0	0.0%	25,492	66.9%	12,613	33.1%
PP (# 5)	16.3%	7,343	5,634		5,064			886	3,735	2,342	17,661	25,004	0	0.0%	16,728	66.9%	8,276	33.1%
PS (# 6)	5.8%	3,861			3,355			443	506	633	4,937	8,798	6	0.1%	5,882	66.9%	2,910	33.1%
OTHER (# 7)	14.9%	21,775			506			190	0	253	949	22,724	1,211	5.3%	14,392	63.3%	7,121	31.3%
TOTAL TONS	100.0%	45,450	5,761	6,013	25,129	5,697	4,368	16,772	26,838	16,964	107,542	152,992	11,148	7.3%	94,894	62.0%	46,950	30.7%
% OF TOTAL PLASTICS/RESINS (BY APPLICATION)***		<u>29.7%</u>	3.8%	3.9%	16.4%	3.7%	2.9%	11.0%	17.5%	11.1%	<u>70.3%</u>							

* Polyethylene Terephthalate - PETE - # 1; High Density Polyethylene - HDPE - # 2; Polyvinyl Chloride - PVC - # 3; Low/Low Linear Density Polyethylene - LDPE/LLDPE - # 4; Polypropylene - PP - # 5; Polystyrene - PS - # 6; Other - Other - # 7

** Durable goods are products that have an expected use life of 3 years or more; Nondurable goods have an expected use life of less than 3 years

*** Includes 158 tons of PETE, 1683 tons of HDPE and 192 tons of 'Other' reported by public recycling programs

****1999 US EPA Waste Characterization Study reports plastics make up 10.5 of the nation's MSW tonnage. In 1999, Maine's MSW tonnage was 1,457,060 tons, so plastics would be approximately 152,992 tons. In 1999, 66.9% of Maine's non-recycled MSW was disposed of in incinerators and 33.1% disposed of at landfills.

APPENDIX E *

POSSIBLE PATHWAYS FOR MANAGEMENT OF POLYVINYL CHLORIDE PLASTICS TO KEEP THEM OUT OF THE MSW INCINERATORS

OPTION 1: DO NOT PURCHASE PRODUCTS PACKAGED IN OR CONTAINING PVC PLASTICS

MANAGEMENT STRATEGY FOR DISCARDED PVC PLASTICS:

- A. NOT NEEDED
- B. CONTINUING EDUCATION ON USE OF PVC PLASTICS
- C. CONTINUING MATERIAL SUBSTITUTION BY MANUFACTURERS AND USERS OF PVC PLASTICS

OPTION 2: MANAGING DISCARDED PVC PLASTIC PRODUCTS AND CONTAINERS

MANAGEMENT STRATEGY FOR DISCARDED PVC PLASTICS:

- A. SEPARATE PVC PLASTICS FROM GENERAL MUNICIPAL SOLID WASTE STREAM
 - I. REUSED
 - a. AT END OF REUSE LIFE, IS PRODUCT/CONTAINER?
 - 1) RECYCLED
 - 2) LANDFILLED
 - II. RECYCLED
 - a. COLLECTION STRATEGY, PROGRAM
 - 1) MUNICIPAL
 - 2) PRODUCER FURNISHED
 - 3) OTHER
 - b. MARKETS – BOTH ACCESSIBLE AND AVAILABLE
 - c. PROCESSING SYSTEM
 - III. LANDFILLED
 - a. COLLECTION STRATEGY, PROGRAM
 - 1). MUNICIPAL
 - 2). PRODUCER FURNISHED
 - 3). OTHER
 - b. ACCESS AND DELIVERY TO SECURE LANDFILL

* This 'tree' of management options was developed by the State Planning Office and was intended to serve as a tool assisting with the discussion undertaken by the study group. This tree is not intended to represent the view, position or endorsement of any organization, trade group or activity.